REMARKS

In light of the foregoing Amendments and following Remarks, reconsideration and allowance of the above-captioned application are respectfully requested.

The Applicants and their representative would like to thank Examiner Jackson for the time and courtesy she extended during a telephone interview with the undersigned Thursday, February 3, 2005. During the interview, the presently submitted claim amendments were discussed. In particular, the Examiner stated that the presently submitted amendments appear to differentiate the claims over the cited art, and she would carry out a further search of the art based upon the amended claims following this submission. In addition, the fact that certain of the presently submitted amendments are for language clarification purposes only, and are not related to patentability of the claims was briefly discussed. For instance, the amendment of the phrase "at least about 2000" in claims 1 and 17 for the phrase "about 2000 or greater" was not made for any reason related to patentability of the claims.

The presently pending application is generally directed to methods for modifying the surface of a substrate. For instance, in one embodiment, the present methods include forming a cross-linked polymeric anchoring layer on a substrate by applying a polymer comprising epoxy functionality to a substrate, reacting a portion of the epoxy groups on the polymer with functional groups of the substrate, such that the polymer is directly bound to the substrate, and cross-linking the polymer via reaction of another portion of the epoxy groups. Following attachment and cross-linking, the polymeric anchoring layer can still comprise epoxy functionality that can be used, for example, to graft additional materials to the substrate via the anchoring layer.

In the Office Action, claims 1-27 were rejected under 35 U.S.C. §112, second paragraph as being indefinite. In particular, the term "molecular weight" as recited was believed to be indefinite. In response, the term "molecular weight" in the claims has been clarified to refer to the number average molecular weight. Support for this amendment can be found in the written description of the application, for instance in paragraph 67 in the example section of the application.

In addition, the term "at least about" was noted as an indefinite term which renders the claim indefinite. Claims reciting the specific term "at least about" have been held invalid for indefiniteness where there was close prior art and there was nothing in the specification, prosecution history, or the prior art to provide any indication as to what range of specific activity is covered by the term "about" (*Amgen, Inc. v. Chugai Pharmaceutical Co.*, 927 F.2d 1200, 18 USPQ2d 1016 (Fed. Cir. 1991).) In the instant case, Applicants do not believe this finding applies. However, and as discussed above, in order to further prosecution of the application, Applicants have amended the term "at least about" herein.

Claims 6 and 20 were also rejected under 35 U.S.C. §112, second paragraph. Accordingly, the Markush language of the claims has been amended in the presently submitted claims.

In the Office Action, claims 1 and 14-16 were rejected under 35 U.S.C. §103(a) as being unpatentable over Afeyan, et al. (U.S. Patent No. 5,503,933). Afeyen, et al. teaches a surface modification technique for fabricating hydrophilic coatings covalently attached to the hydrophobic surfaces of polymers such as polystyrene divinylbenzene. In particular, a polymeric material having a hydrophobic surface comprising an unsaturated group is provided and a polymer comprising a hydrophobic domain and a hydrophilic domain is provided. The hydrophobic domain of the polymer also includes an unsaturated group therein. Upon application of the polymer to the surface in a liquid phase that is hydrophilic with respect to the surface, the hydrophobic domain of the polymer will be oriented toward the hydrophobic surface and the hydrophilic domain will extend outwardly from the surface. The polymer can then cross-link to the hydrophobic surface via reaction between the unsaturated groups (e.g., via a free radical reaction) to produce a hydrophilic coating covalently bound to the surface of the polymer. (Col. 5, ll. 14-45.)

In contrast, the present claims are directed to a surface modification technique in which a polymer comprising epoxy functionality is bound to a substrate via reaction of a portion of the epoxy groups of the polymer with functional groups of the substrate that are reactive with the epoxy. Thus, the processes of the present invention utilize

different reaction strategies than those disclosed or suggested by Afeyan, et al. As such, Applicants respectfully submit that claims 1 and 14-16 patentably define over Afeyan, et al.

In the Office Action, claims 1-27 were rejected under 35 U.S.C. §103(a) as being unpatentable over Filippou, et al. (U.S. Patent No. 6,706,320).

As correctly pointed out in the Office Action, Filippou, et al. teach a process for modifying the surface of a substrate by contacting the surface with a modifying agent to bond the modifying agent to the surface. Moreover, the functionality of the modifying agent is chosen to provide good adhesion to the substrate and surface chemical reactivity for subsequent reaction with other material. The particular modifying agents of Filippou, et al. may be coupling agents such as organo titanates, organo silanes, and organo zirconates (col. 12, ll. 52-65), or they may be multi-functional amine-containing organic compounds (col. 12, l. 66 – col. 13, l. 60).

Epoxy-containing compounds are disclosed in Filippou, et al. as possible cross-linking agents for cross-linking the modifying agents one to another, but these cross-linking materials are only described as being bound to the modifying agents, to other cross-linker molecules, or to a co-crosslinking compound (col. 14, l. 56 – col. 15, l. 7). Thus, Filippou, et al. does not disclose or suggest a surface modification process including reaction of an epoxy group on a polymer directly with functional groups of a substrate in order to directly bond the epoxy-containing polymer to the substrate, as is found in the presently pending claims. As such, Applicants respectfully submit that the presently pending claims patentably define over Filippou, et al.

It is believed that the present application is in complete condition for allowance and favorable action, therefore, is respectfully requested. Examiner Jackson is invited and encouraged to telephone the undersigned, however, if any issues remain after consideration of this response.

Please charge any additional fees required by this Amendment to Deposit Account No. 04-1403.

Respectfully submitted,

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2/4/05
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